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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:
Willibrord A. Groten

Serial No.: 10/015,863

Filed: 12/12/01

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Atty. File: CDT 1756-2

Group Art Unit: 1764

Examiner: J. Arnold, Jr.

FOR: Process for Sulfur Reduction in Naphtha Streams

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

1. Transmitted herewith in triplicate is the APPEAL BRIEF in this application with respect to the Notice of Appeal.

2. STATUS OF APPLICANT

This application is on behalf of
☒ other than a small entity
☐ small entity

3. ☐ Applicant hereby petitions for an extension of time of (1) month for filing the Brief from the Notice of Appeal filed _____ as provided in 37 CFR 1.136 (a).
☐ a fee in the amount of \$
☐ is enclosed
☐ charge to Deposit Account No. 10-0740. (Duplicate notice enclosed.)
☐ fee previously paid

4. FEE FOR FILING APPEAL BRIEF

Pursuant to 37 CFR 1.17(f) the fee for filing the Appeal Brief is:

☐ small entity \$165.00
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Appeal Brief fee due \$330.00

5. FEE PAYMENT

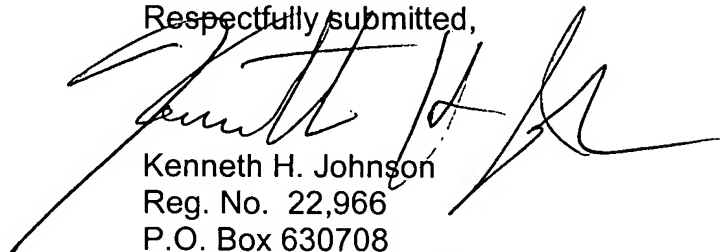
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This sheet is presented in duplicate.

Date: 06/03/04

Respectfully submitted,

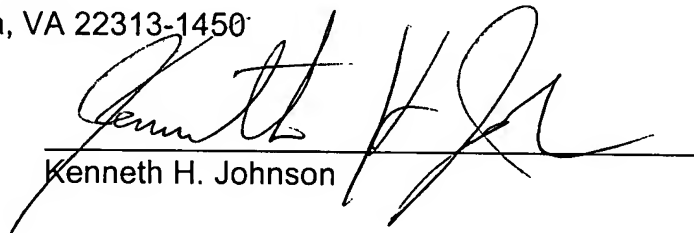

Kenneth H. Johnson
Reg. No. 22,966
P.O. Box 630708
Houston, Texas 77263
Tel. (713) 780-7047
FAX No. (713) 780-7671

CERTIFICATE OF MAILING

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on 06/03/04


Kenneth H. Johnson



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In Re Application of:
WILLIBRORD A. GROTEN

§ Atty File: CDT 1765-2

§

§

Serial No.: 10/015,863

§ Group Art Unit: 1764

§

Filed: 12/12/2001

§ Examiner: J. ARNOLD, JR.

For: PROCESS FOR SULFUR REDUCTION IN NAPHTHA STREAMS

BRIEF ON APPEAL

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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I.

REAL PARTY IN INTEREST

The subject patent application is assigned of record to Catalytic Distillation Technologies. Therefore, the real party in interest is Catalytic Distillation Technologies

II.

RELATED APPEALS

There are no related appeals or interferences known to appellant or appellant's legal representative which will directly or indirectly affect or be affected by or have a bearing on the Board's decision in this appeal.

III.

STATUS OF CLAIMS

Claims 1-11 remain in the application. All of the claims were rejected. Claims 1-11 are on appeal.

IV.

STATUS OF AMENDMENTS

All amendments have been entered.

V.

SUMMARY OF THE INVENTION CLAIMED ON APPEAL

The present invention relates to a process for concurrently fractionating and hydrotreating a full range naphtha which is split into a light boiling range naphtha, a medium boiling range naphtha and a heavy boiling range naphtha and each boiling range naphtha is treated separately to achieve a combined desired total sulfur content. (Spec page 1, ln 4-9.)

The following summary is taken verbatim from the patent application at page 4 line 15 to line 25.

“Preferably the process comprises the steps of:

(a) separating the full boiling range cracked naphtha stream into three fractions comprising a light cracked naphtha fraction, preferably boiling in the range of C₅ to about 150°F, an intermediate cracked naphtha fraction preferably boiling in the range of about 150 to about 250°F and a heavy cracked naphtha preferably boiling in the range of about 250 to 450°F;

(b) subjecting the heavy cracked naphtha to hydrodesulfurization in a first hydrodesulfurization reactor containing a hydrodesulfurization catalyst; and

(c) combining the effluent from the first hydrodesulfurization reactor with the intermediate cracked naphtha and subjecting the combined stream to hydrodesulfurization in a second hydrodesulfurization reactor.”

VI. ISSUE

1. Are claims 1-11 *prima facie* obvious over EP 0725126 (EP) in view of Audeh et al US 4265735 (Audeh) and Putman US 6231752 (Putman)?

VII. GROUPING OF CLAIMS

Claims 1-11 are grouped together in view of the nature of the rejection.

VIII. ARGUMENT

A. The Rejection

In the Final Office Action:

Claims 1-11 were rejected under 35 USC 103(a) over EP 0725126 (EP) in view of Audeh et al US 4265735 (Audeh) and Putman US 6231752 (Putman).

B. Issue

ARE CLAIMS 1-11 *PRIMA FACIE* OBVIOUS OVER EP 0725126 (EP) IN VIEW OF AUDEH ET AL US 4265735 (AUDEH) AND PUTMAN US 6231752 (PUTMAN)?

The examiner admits that the EP reference is deficient in that the following elements of the claims are not taught:

1. "The reference does not disclose a desulfurization process comprising the steps of separating the full boiling range cracked naphtha stream into three fractions comprising a light cracked naphtha fraction, an intermediate cracked naphtha fraction, and a heavy cracked naphtha; subjecting the heavy cracked naphtha to hydrodesulfurization in a first hydrodesulfurization reactor containing a hydrodesulfurization catalyst; and combining the effluent from the first hydrodesulfurization reactor with the intermediate cracked naphtha and subjecting the combined stream to hydrodesulfurization in a second hydrodesulfurization reactor."

2. "The reference does not disclose a process wherein light cracked naphtha contains substantially all of the mercaptans and is subjected to a wet caustic wash process wherein the mercaptans contained therein are converted to sulfides and said sulfides are removed."

3. "The reference does not disclose a process wherein the intermediate cracked naphtha contains mercaptans and substantially all of the thiophenes and substantially all of said mercaptans and thiophenes are converted to hydrogen sulfide in a second hydrodesulfurization reactor."

4. "The reference does not disclose a process wherein said heavy cracked naphtha contains thiophenes and substantially all of said other organic sulfur compounds and a

portion of said thiophenes and other organic sulfur compounds are converted to hydrogen sulfide in said first hydrodesulfurization reactor.”

5. “The reference does not disclose a process wherein substantially all of the remaining thiophenes and other organic sulfur compounds are converted to hydrogen sulfide in said second hydrodesulfurization reactor.”

6. “The reference does not disclose a process wherein the full boiling range cracked naphtha stream is first subjected to thioetherification in a thioetherification reactor prior to separating the full boiling range cracked naphtha stream into said three fractions, wherein substantially all of said mercaptans are reacted with a portion of said diolefins to form sulfides.”

7. “The reference does not disclose a process wherein said sulfides are removed in said heavy cracked naphtha and substantially all of said sulfides are converted to hydrogen sulfide in said first hydrodesulfurization reactor.”

8. “The reference does not disclose a process wherein the remaining sulfides are converted to hydrogen sulfide in said second hydrodesulfurization reactor.”

9. “The reference does not disclose a process wherein the intermediate cracked naphtha fraction boils in the range of about 150 to 250 F.”

The examiner does not allege that either of the two secondary references, Audeh or Putman disclose any items that are deficient in the EP reference or in any manner teach to combine their respective processes with the EP process to meet the terms of the claims. Therefore, the rejection fails to make out a *prima facie* case of obviousness. The examiner has numerous statements that the various steps in the present claimed process are “obvious”, however there is no evidence of that. It is mere conjure and speculation.

It is well settled that a rejection based on § 103 must rest upon a factual basis rather than conjecture or speculation. "Where the legal conclusion of [of obviousness] is not supported by the facts it cannot stand." *In re Warner*, 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967); see also *In re Sporck*, 301 F.2d 686, 690, 133 USPQ 360,364 (CCPA 1962). "Obviousness cannot be established by combining teachings of the prior art to produce the claimed invention, *absent* some teaching suggestion or incentive supporting the combination." *In re Geiger*, 2 USPQ2d 1276 (CAFC 1987). Hence, without the requisite teaching, suggestions or incentives there is no *prima facie* case and the rejection must fail. The court was addressing piecemeal combination of teachings, which could be argued met the claims, however, the proposed combination does not even meet the claims of the present invention and does not even rise to the level of putative *prima facie* case. See also *In re Fine*, 5 USPQ2d 1596 and *Ex parte Levengood*, 28 USPQ2d 1300 (BdPatApp 1993).

The examiner urges that "...where a limitation was not found in the references, appropriate motivation and rationale were given for each obviousness determination." However, a determination of obviousness must involve more than indiscriminately combining prior art; a motivation or suggestion to combine the art must exist. *ACS Hosp. Sys., Inc. v. Montefiore Hosp.* 221 USPQ 929,933 (Fed. Cir. 1984); *Micro Chemical Inc. v. Great Plains Chemical Co.*, 41 USPQ2d 1238, 1244 (fed. cir. 1997). The examiner can satisfy the burden of showing obviousness of the combination "only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references", *In re Lee*, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002), citing *In re Fritch*, 972

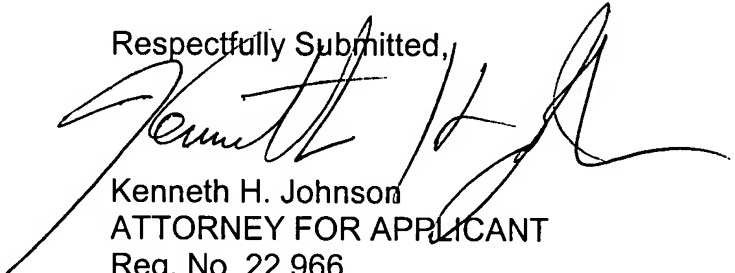
F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992). In the present situation the record contains no evidence of a motivation, the mere assertion of the by the examiner not being "objective prior art" to present such evidence.

C. Conclusion

In summary, the examiner set out nine failures of the primary reference as regards the present claims and only by fallacious inductive reasoning combined the cited references to make a putative obviousness rejection.

Applicant respectfully requests that the board reverse the examiner.

Respectfully Submitted,



Kenneth H. Johnson
ATTORNEY FOR APPLICANT
Reg. No. 22,966
P.O. Box 630708
Houston, Texas 77263
TEL: (713) 780-7047
FAX: (713) 780 7671

Date

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KENNETH H. JOHNSON



IX. APPENDIX

A. CLAIMS ON APPEAL

1. A process for reducing the organic sulfur content of a full boiling range cracked naphtha stream containing olefins, diolefins, mercaptans, thiophenes, and other organic sulfur compounds, comprising the steps of:

(a) separating the full boiling range cracked naphtha stream into three fractions comprising a light cracked naphtha fraction, an intermediate cracked naphtha fraction and a heavy cracked naphtha;

(b) subjecting the heavy cracked naphtha to hydrodesulfurization in a first hydrodesulfurization reactor containing a hydrodesulfurization catalyst; and

(c) combining the effluent from the first hydrodesulfurization reactor with the intermediate cracked naphtha and subjecting the combined stream to hydrodesulfurization in a second hydrodesulfurization reactor.

2. The process according to claim 1 wherein said light cracked naphtha contains substantially all of the mercaptans and is subjected to a wet caustic wash process wherein the mercaptans contained therein are converted to sulfides and said sulfides are removed.

3. The process according to claim 1 wherein said intermediate cracked naphtha contains mercaptans and substantially all of the thiophenes and substantially all of said mercaptans and thiophenes are converted to hydrogen sulfide in said second hydrodesulfurization reactor.

4. The process according to claim 1 wherein said heavy cracked naphtha contains thiophenes and substantially all of said other organic sulfur compounds and a portion of

said thiophenes and other organic sulfur compounds are converted to hydrogen sulfide in said first hydrodesulfurization reactor.

5. The process according to claim 4 wherein substantially all of the remaining thiophenes and other organic sulfur compounds are converted to hydrogen sulfide in said second hydrodesulfurization reactor.

6. The process according to claim 1 wherein said full boiling range cracked naphtha stream is first subjected to thioetherification in a thioetherification reactor prior to separating the full boiling range cracked naphtha stream into said three fractions, wherein substantially all of said mercaptans are reacted with a portion of said diolefins to form sulfides.

7. The process according to claim 6 wherein said sulfides are removed in said heavy cracked naphtha and substantially all of said sulfides are converted to hydrogen sulfide in said first hydrodesulfurization reactor.

8. The process according to claim 7 wherein the remaining sulfides are converted to hydrogen sulfide in said second hydrodesulfurization reactor.

9. The process according to claim 1 wherein said light cracked naphtha fraction boils in the range of C_5 to about 150°F, said intermediate cracked naphtha fraction boils in the range of about 150 to about 250°F and said heavy cracked naphtha boils in the range of about 250 to 450°F.

10. A process for reducing the organic sulfur content of a full boiling range cracked naphtha stream containing olefins, diolefins, mercaptans, thiophenes, and other organic sulfur compounds, comprising the steps of:

(a) subjecting the full boiling range naphtha to thioetherification in a thioetherification

reactor wherein substantially all of said mercaptans are reacted with a portion of said diolefins to form sulfides;

(b) separating the effluent from the thioetherification reactor into three fractions comprising a light cracked naphtha fraction boiling in the range of C₅ to about 150°F, an intermediate cracked naphtha fraction boiling in the range of about 150 to about 250°F and a heavy cracked naphtha boiling in the range of about 250 to 450°F;

(b) subjecting the heaving cracked naphtha to hydrodesulfurization in a first hydrodesulfurization reactor containing a hydrodesulfurization catalyst; and

(c) combining the effluent from the first hydrodesulfurization reactor with the intermediate cracked naphtha and subjecting the combined stream to hydrodesulfurization in a second hydrodesulfurization reactor.

11. A process for reducing the organic sulfur content of a full boiling range cracked naphtha stream containing olefins, diolefins, mercaptans, thiophenes, and other organic sulfur compounds, comprising the steps of:

(a) separating the full boiling range cracked naphtha stream into three fractions comprising a light cracked naphtha fraction boiling in the range of C₅ to about 150°F, an intermediate cracked naphtha fraction boiling in the range of about 150 to about 250°F and a heavy cracked naphtha boiling in the range of about 250 to 450°F;

(b) subjecting the heaving cracked naphtha to hydrodesulfurization in a first hydrodesulfurization reactor containing a hydrodesulfurization catalyst;

(c) combining the effluent from the first hydrodesulfurization reactor with the intermediate cracked naphtha and subjecting the combined stream to hydrodesulfurization in a second hydrodesulfurization reactor and

(d) subjecting said light cracked naphtha to a wet caustic wash wherein substantially all of the mercaptans contained therein are converted to sulfides.